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1. *Chlorophyll a* (Chl *a*)

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1 | Introduction

This manual provides information on the installation instructions and environment, as well as usage of the ThurayaMarine Omni-Directional Antenna.

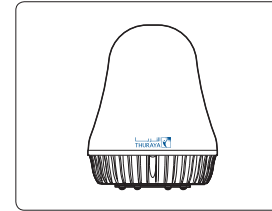
The ThurayaMarine Omni-Directional Antenna is connected to the ThurayaMarine Terminal to provide stable transmission and receiving of Thuraya satellite signals and GPS signals for vessels that experience rolling, pitching, and yawing.

2 | Package Content

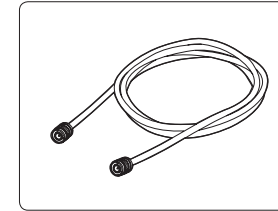
The ThurayaMarine Omni-Directional Antenna package includes the following parts:

No.	Item	Specifications	Quantity	Remarks
1	Omni Directional Antenna Unit	Max. EIRP : > +8dBW min. G/T : > -22dBk	1	
2	SAT Antenna RF Cable	6.1Ø (Black), 12M, TNC (F)-TNC (F)	1	Silver Color
3	GPS Antenna RF Cable	4.95Ø (Black), 12M, TNC (F)-TNC (F)	1	Gold Color
4	Mounting Pipe	2.5" phi x 30 cm	1	
5	Mounting Pipe Screw	4	5	
6	U-Bolt /Washer/Nut		2/4/4	
7	Ground Wire	0.2M, Copper Wire	1	
8	Installation Manual		1	

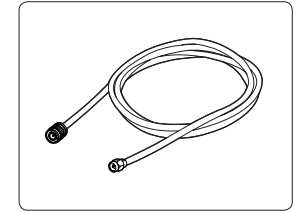
The appearance of each part is illustrated in the images below:



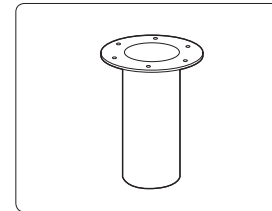
Antenna Unit



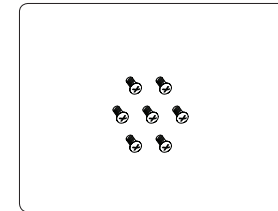
SAT RF Cable



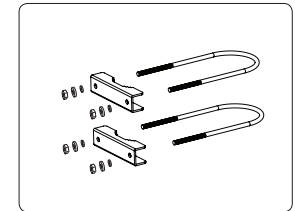
GPS RF Cable



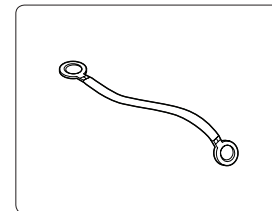
Mounting Pipe



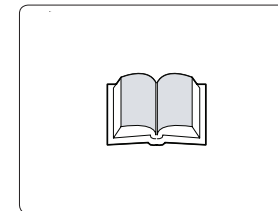
Bolts



U-Bolt/Washer/Nut



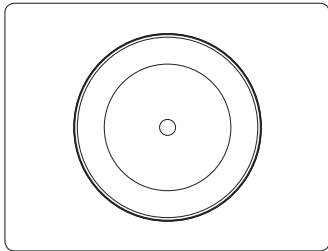
Ground Wire



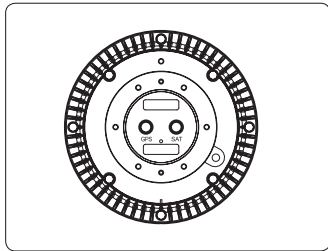
Installation Guide

3 | System Configuration

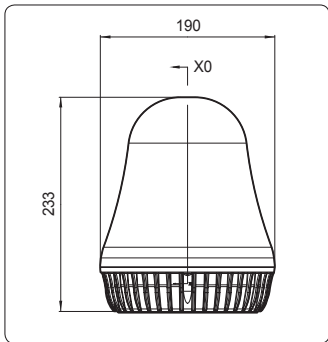
3.1 Mechanical outlines *



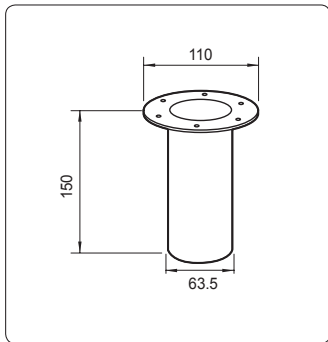
Top View



Bottom View



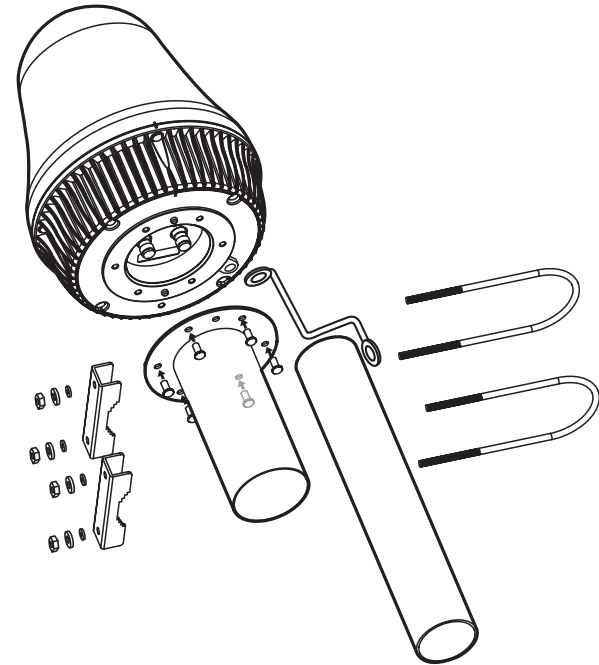
Front View



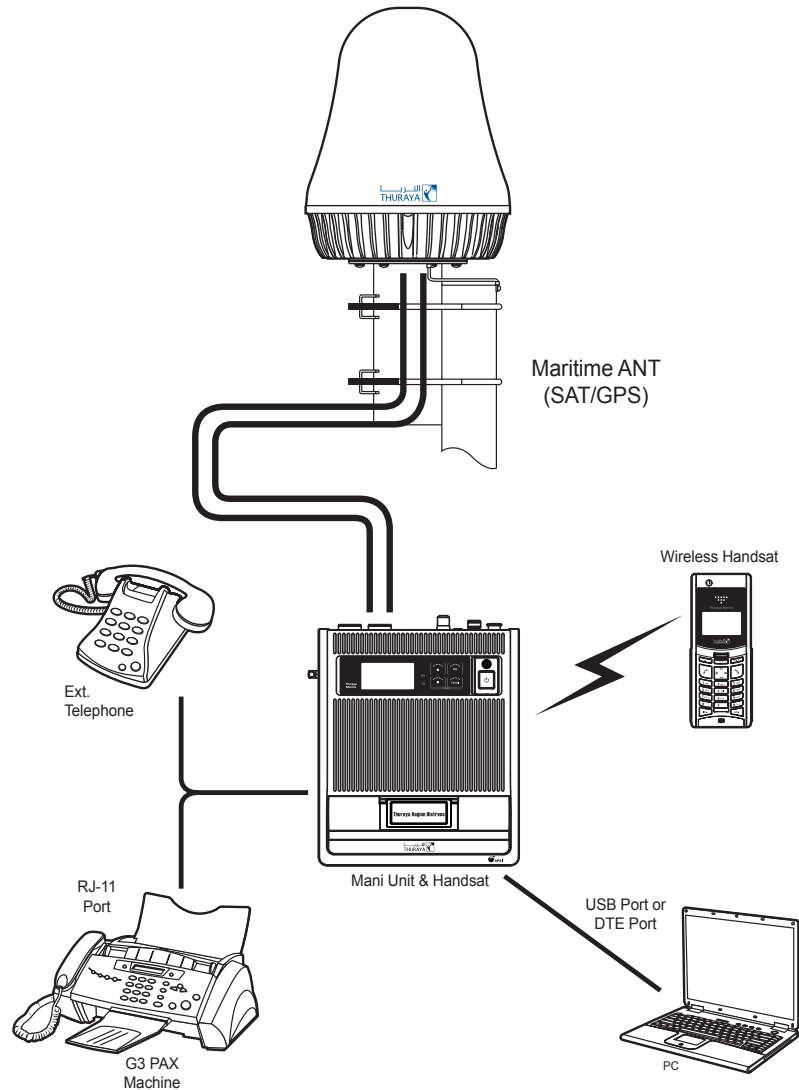
Mounting Pipe

* Unit: mm

3.2 Exploded View



3.3 System Connection Diagram



4 | Description of Parts

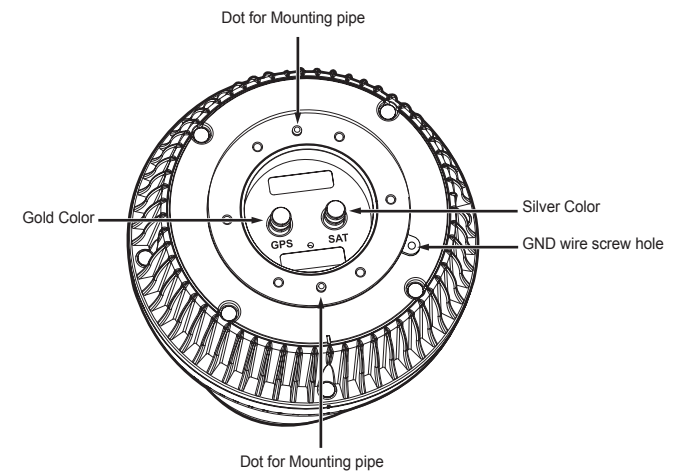
4.1 Antenna Unit

4.1.1 Connector Interface

The antenna unit has two TNC female connectors at its base. One connector is the SAT signal port, and the other is the GPS signal port.

The SAT connector is silver while the GPS connector is gold. In addition, labels of SAT and GPS are marked over each connector to make distinction even easier.

Connecting the RF cable with the SAT and GPS connectors is easy as both the colors of the SAT cable and GPS cable are silver and gold, respectively and the connection can be done by simply matching the colors. However, if the two connectors are switched and connected wrongly, the antenna will not operate properly.



At the base of the Antenna Unit, there are two projections and six screw holes. These are used when coupling with the mounting pipe.

**Warning**

Make sure that the cables are not switched when connecting, as doing so will result in improper antenna operation.

4.1.2 Power Supply

The antenna unit is powered by DC voltage from the ThurayaMarine terminal via the GPS RF cable.

The ThurayaMarine terminal supplies DC12V power to the antenna unit. The DC voltage range that is operational for the antenna unit is +10Vdc ~ +15Vdc.

Proper RF cable connection by the user can negate any need for concern regarding the power supply.

**Warning**

This antenna is designed exclusively for ThurayaMarine terminal. If connecting the antenna with a terminal other than ThurayaMarine, make sure that the input DC voltage is within the rating +10Vdc to +15Vdc (3 A). Otherwise, it may cause a fire or damage to the device.

4.2 RF Cables

4.2.1 SAT RF Cable

The SAT RF cable is 12M in length and is fitted with a TNC male type connector at each end.

Optional cables of lengths of 20M, 35M, and 50M are available for purchase from a dealer if excess of 12M long cable is required.

4.2.2 GPS RF Cable

The GPS RF cable is 12M in length and is fitted with a TNC male type connector and an SMA male type connector at either end.

The TNC connector must be connected to the antenna unit, and the SMA connector must be connected to the GPS port of the ThurayaMarine terminal.

If the RF cables used are non-authentic and unauthorized, voltage drops may occur in the RF cables due to the high electrical current (approx. 2.0A ~ 2.5A) consumed by the antenna unit. Therefore, producing and/or using any non-authentic, unauthorized RF cable is prohibited in principle as doing so can result in severe damage to antenna performance.

Optional cables of lengths of 20M, 35M, and 50M are available for purchase from a dealer if excess of 12M long cable is required.

**Warning**

Only products that are authentic and/or recommended by authorized vendors should be used as RF cables directly impact antenna performance.

4.3 Mounting Pipe and U-Bolt

As essential fixing accessory, the mounting pipe and U-bolt are coupled to the mounting post on which the antenna is installed on the vessel.

After fixing the screw at the base of the antenna to affix the mounting pipe, use the U-bolt to tighten the mounting post and mounting pipe.

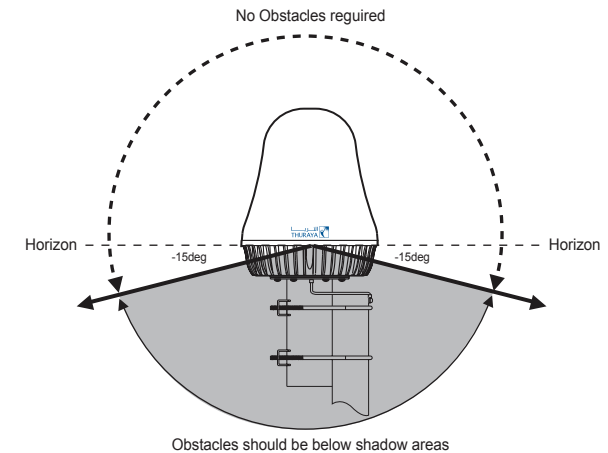
4.4 Ground Wire

The copper ground wire is 20 cm in length and is used to connect the antenna unit and the GND of the vessel.

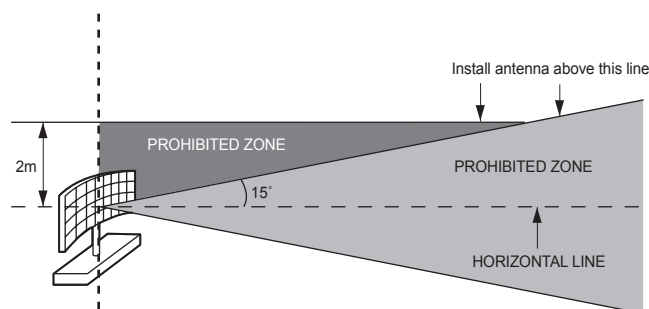
5 | Mounting Location and Considerations

The following precautions should be taken while installing the ThurayaMarine Omni-Directional Antenna to a vessel:

- Placement of the antenna at the highest point of the vessel is recommended, and following installation, no surrounding obstacles and/or objects should obstruct the view of the antenna.
- To allow the antenna to maintain communication capacity when the vessel is rolling or pitching, no obstacles should be in the path of the antenna from the horizontal position to -15° in order to allow corresponding coverage. This concept is illustrated in the image below.



- Make sure that the antenna is placed at a sufficient distance away from any other antenna.
 - The separation distance with HF antennas and VHF antennas should be at least 5 m.
 - The separation distance with a Thuraya Tracking antenna or a tracking antenna made by another manufacturer should be at least 8m.
 - The separation distance with the vessel's compass should be at least 3 m.
 - If the vessel is fitted with Radar, refer to the following diagram and make sure to establish a sufficient separation distance.
 - In case of proximity to the radar is inevitable, ThurayaMarine Antenna unit must not be within the radar beam.



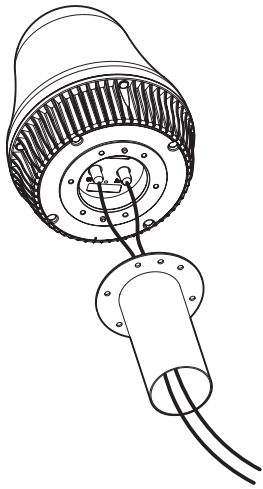
When installing the ThurayaMarine Omni-directional Antenna, make sure to establish sufficient separation distances with any other antennas (VHT, HF, Radar, other tracking antennas, etc.).

- Avoid installing near the vessel's chimneystack. The smoke and soot emitted from the chimneystack can obstruct the signal level achieved by the antenna.
- The antenna unit should not be affixed to any steel panel that is wider than 190 mm square. It can cause performance degradations.
- Keep the unit away from heat sources.
- Do not install the antenna where flammable gases are stored

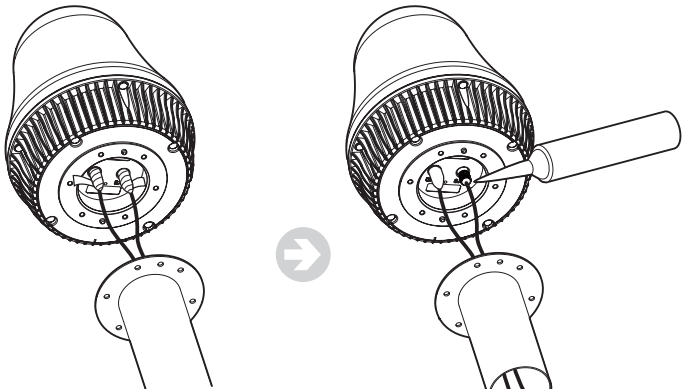
6 | Mounting Procedures

The sequence of installation procedures for the ThurayaMarine Omni-directional Antenna is as follows.

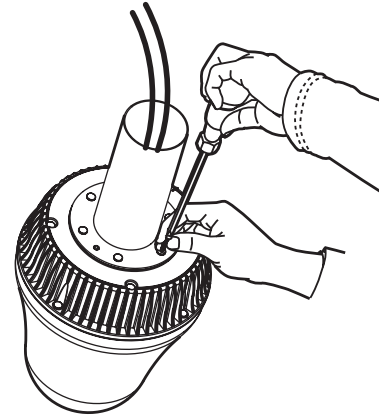
- 1 Open the product package.
- 2 Check to see that all contents have been included in the package.
- 3 Decide on the location on the vessel for installation. Make sure to consider the considerations listed in section 5 during the selection process.
- 4 Locally prepare an antenna mast with a ground stud.
- 5 After passing the RF cables (SAT & GPS) through the mounting pipe, connect the connectors of the antenna unit with the RF cable connectors. Make sure the connections are securely fastened.



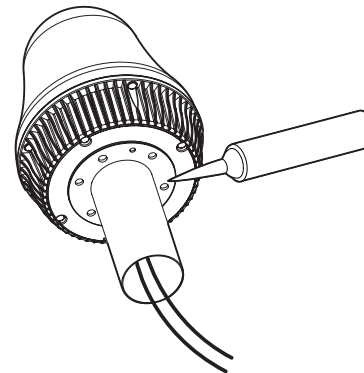
- 6 After tightening the connectors, wrap the connections with self-bonding vinyl tape or apply silicon sealant to make them waterproof.



- 7 After fitting the mounting pipe to the slot in the base of the antenna, tightly fasten the six bolts (M5 x 6ea).

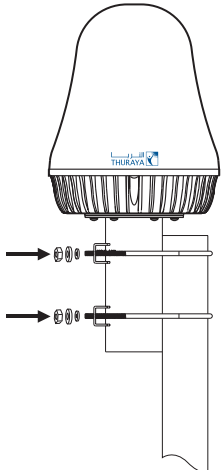


- 8 Apply silicon sealant to the tops of the tightened bolts.

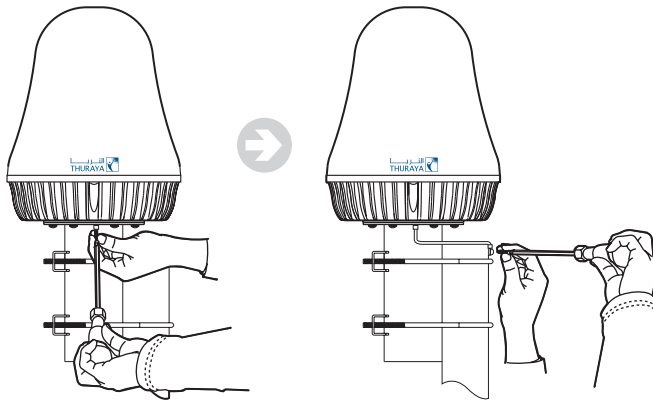




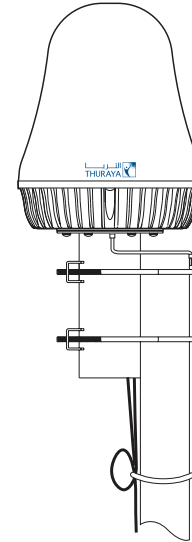
- 9 Use the U-bolt to couple the assembled antenna with the vessel's mounting pole (diameter of two inches recommended). Tighten the nut and make sure it will not become loose.



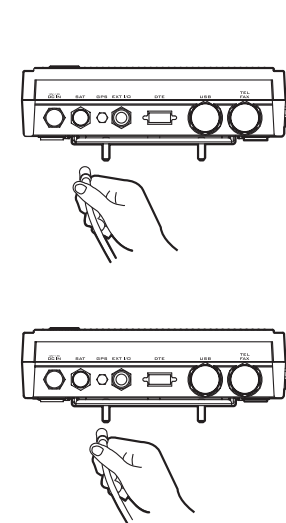
- 10 After tightly securing the ground wire to the ground wire-affixing hole at the base of the antenna via a bolt, tightly secure the other end of the ground wire to the mounting pole.
- 11 Apply silicon sealant on the screw head.



- 12 Fix the cable to the mast with cable tie.(local supply)



- 13 Tighten the SAT and GPS RF connector to the ThurayaMarine terminal.



7 | Safety Distance

The safety levels for the ThurayaMarine Omni-directional antenna units are based on the EMF Council Recommendation 1999-519-EC of ETSI (European Telecommunication Standard Institute). The recommendation will be maximum 8.3W/m².

Based on the above recommendations, the sufficient minimum safety distance is 40cm. Persons should not approach within 0.4meters of a transmitting ThurayaMarine antenna. Microwave radiation can be harmful to the human body.



Warning

The minimum safety distance is 40cm. People should not approach within 0.4meters of a transmitting ThurayaMarine antenna. Microwave radiation can be harmful to the human body

